Computers and Creativity

Letting technology serve the expressive arts

by Dan Watt

In the last few years the computer has become both the tool and the medium of a dramatic new art form. From the title sequences of that weird movie you saw last night to the station breaks on TV, many of the most intriguing images we see these days have been produced with computers. Behind each of those images are highly creative artists, designers, and programmers.

But not everyone sees computers as tools for creative expression. Many educators view computers only as mechanical devices that may stifle rather than promote creativity. And it's certainly true that the bland functionality of most software often hides the creativity involved in programming a computer.

Yet the flowering of computer art in films, on television, and in arcade and video games shows that there must be a creative aspect to computers after all. Moreover, computer-generated art has captured the attention of the younger generation—the prime audience for many of the games and movies

that feature advanced animation.

Despite the younger generation's interest in computer graphics, however, and the veritable flood of computers into schools and homes all over the country, schools and software developers have been slow to capitalize on the artistic potential of the computer. In particular, computers are conspicuously absent from art and music classes in most schools. In a society where we often feel dehumanized
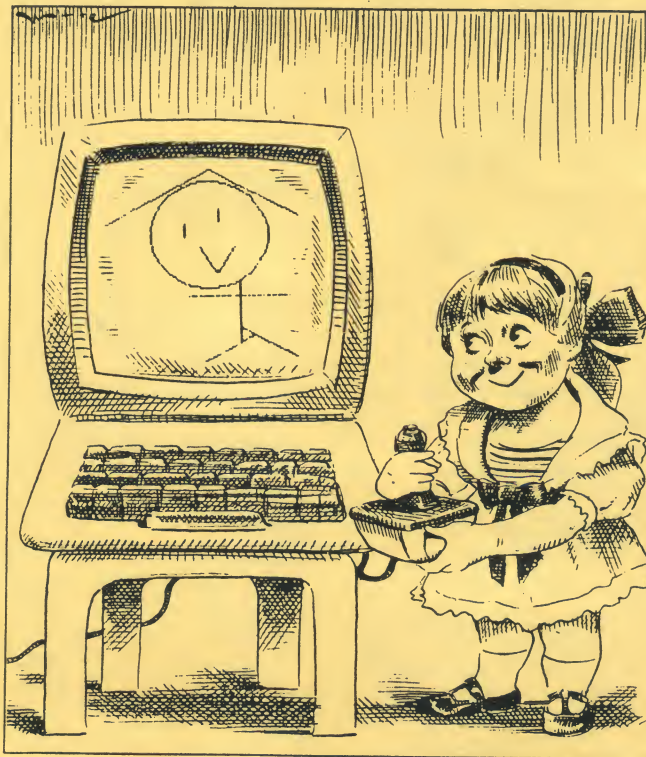

by technology, we can't afford to miss out on an approach that makes technology serve human expression and creativity.

Until recently, computer-based art was the domain of highly paid artist-programmers working with ultrasophisticated computers. Fortunately, this situation is changing. Personal computer software that fosters creativity is starting to appear on the market. And some educational institutions are beginning to recognize the artistic side of computing. From the Capital Children's Museum in Washington, D.C., to a computer art school in Toronto, Canada, to a Massachusetts nursery school, children are getting their hands on computers in settings designed to bring out the creative potential of both child and computer.

Palette and Easel

Many children in the Washington, D.C., area first encounter computers at the Capital Children's Museum. When the museum established its computer exhibit with the assistance of Atari's Home Computer Division, the staff set out to create a friendly, creative, open at-

mosphere in which a child could experience the power of a computer. They searched for an activity that would take no prior knowledge, that would be fun to do, and that above all would put the child immediately in charge of the computer. Finding no existing software that could meet these objectives, the museum hired a programmer and developed its own. As many as 15,000 visitors weekly now use the museum's program, Paint, which is distributed commercially by the Reston Publishing Company. (See our review of Paint on page 116.)

Paint is an artistic tool that turns a computer screen into a combination of palette and easel rolled into one. Using the cursor and the joystick as a paintbrush and the Atari's exciting capacity for color graphics, a child is free to let images flow from his mind to the screen of the computer.

"With 95 percent of existing software, the framework has been determined by someone else," says museum director Ann Lewin. "Paint is one of the few programs available where the child decides what she's going to do. We've tried to make the system so easy to use that the medium is transparent and the kids can get caught up in the process. If you hook a kid's interest, whether it's with finger paints or with an electronic medium that leaves a trace of color on the screen, you're going to see the same concentration, drive, and energy."

The Koalapad (Koala Technologies, 4962 El Camino Real, Los Altos, CA 94022) offers a similar capability for the Apple II and other computers. Using a touch-sensitive pad rather than a joystick, a young artist can construct a variety of colorful screen images in a playful and creative manner.

Yet Paint and the Koalapad represent only the beginnings of computer creativity. After you've

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created something on the screen, you really can't do anything with the image other than look at it. You can't easily use it for another activity. With Paint, you can't even get a printed copy of the screen except by taking a snapshot.

Make It and Change It

West Coast author, educator, and software designer Ramon Zamora says that it's the ability to try out an idea and then change things that makes computer-based activities so powerful. "The key difference between the computer and other art media such as watercolors is that once you've put something on the computer screen you can change it. You can take an image and process it: add or change colors, move things around. You can't do that kind of editing with other media," Zamora claims.

Zamora's software development company, Childware, has several products in the works designed to foster creativity. One program, a sort of construction set, incorporates sound, music, text, graphics images, and animation. Once you've created a group of objects, you can edit or rearrange them and play them back to make a kind of movie. Another product is a turtle drawing activity in which you control the entire process with a joystick. After creating an object, you can put it in a toy box—the equivalent of creating a procedure in Logo. You can create new objects using ones you've already put in the box. "It's an art activity that also teaches modular programming," says Zamora.

Creating with Computers

Stephen W. Long, a Canadian artist and teacher who runs an art school in Toronto called Creating with Computers, says an activity has to go way beyond graphics to realize the potential of computer-based creativity. "I think of art primarily as an *experience* that the artist creates for you and, if possible, with you," Long explains.

According to Long, the true ar-

tistic potential of the computer isn't realized until a creation is interactive. "The best use of the computer involves not only creating an experience for others but also involving them in creating a new experience by using what you've given them. This is what I'm trying to do in my art and in my teaching."

Working with kids between the ages of 9 and 17, Long starts by asking them to invent their own fantasies based on situations drawn from the popular culture. Typical starting points might be, "What would have happened if Elliot had decided to go home with ET at the end of the movie?" or "What is Pac-Man really like, and how did he get to earth?"

After the kids develop their ideas into scenarios, they work in groups of three to bring their fantasies to life with the computer. Using the best technical tools available, the students work on different parts of the project. "Someone will use the Graphics Magician to work on animation. Somebody else will use Graforth to create sounds. The third might use Logo to experiment with changing shapes. Then maybe they'll use EZ Draw to generate some text. Gradually they begin to pull the whole thing together."

Pulling things together requires a teacher with a lot of technical know-how. To eliminate this technical hurdle, Long has a grant from the Ontario Ministry of Education to develop a new programming language, called Create, which will combine the virtues of application tools such as Graphics Magician and EZ Draw with the ability to put all the elements together into a coherent art experience. Like FORTH and Logo, the language will contain built-in primitive commands and the ability to create new ones. It will enable kids to build their own commands, swap their work with other kids, and easily combine the efforts of several artists into one larger project.

The goal, says Long, is to help

both artist and audience develop new insights and perceptions. "While I recognize that some of the most creative people involved in this field are creating video games and TV commercials, my bias is toward building a sense of elegance, developing an integrated sensory experience, and dealing with profound human values.

"The key thing that makes something art," says Long, "is the power to change someone's perceptions, and that includes both the person who makes it and the one who uses it. Take the example of the history of Pac-Man that several groups of kids have worked on. When other kids see that, they say, 'Oh wow! I never knew Pac-Man came from another planet.' And when they go back to playing Pac-Man, their perception is slightly altered. They're just a little bit more involved in and informed about their own culture, even if only imaginatively."

Electronic Finger Painting

David Alexander, a lecturer at Tufts University's Child Study Center in Medford, Massachusetts, spent the past year observing a group of 3-year-olds use a program called Delta Drawing, distributed by Spinnaker Software (215 First St., Cambridge, MA 02142). Based on Logo's turtle graphics, Delta Drawing lets kids draw lines and shapes on a computer screen by pressing individual keys on the keyboard. Later they can redraw individual designs, combine shapes, and color them in. Alexander says Delta Drawing has changed his mind about computers and toddlers.

"A couple of years ago I would have said that computer activities were not appropriate for anyone, let alone preschoolers," he explains. "But I feel really good about the way kids have taken to Delta Drawing. It's available as a choice, along with the sand table, water play, dress ups, blocks, and finger paints. And the kids use it that way. They come and go from

the computer just as they do with any other activity. If the kids were not attracted to it, if they were trivial or flirtatious with it, or if they became addicted to it, I'd say it wasn't appropriate. What really convinced me was when I watched a 3-year-old with Pampers sticking out of the top of his pants use Delta Drawing. There he was, not yet toilet trained but competent with the computer. I never had any question after that."

Louise Birch uses a similar single-key, Logo-based drawing program in her kindergarten class at the Meadowbrook School in Weston, Massachusetts. She sees many direct benefits, especially for kids who are uncomfortable with other artistic media. "A lot of little kids are very uptight about doing things correctly. And they're afraid to make mistakes," she asserts. "One of the greatest things about using a computer is that kids begin to take risks. One little boy last year was afraid to do anything: He wouldn't even try to draw anything because he was afraid that it wouldn't look as perfect as a photograph. Then he started experimenting with the computer and began to loosen up a bit. Little by little he began drawing and writing."

Computers in Art Class

In researching this article, I heard artists, software developers, psychologists, and educators speak glowingly of the potential for computers and creative expression. At the same time, I could not identify one example of using a computer in an art class as part of the regular curriculum. There may be many reasons for this, but I suspect that many art teachers have simply not yet joined the computer age.

Professor Diana Korzenick, who heads the Department of Art Education at the Massachusetts College of Art in Boston, wants to change that. "The computer belongs in the art class," she says, and the college ran a course this summer to plant some seeds for this

idea. Called The Computer for Art Educators, the course included aspects of computer literacy such as BASIC programming and word processing, along with the use of tools that apply specifically to the arts.

Next April, the college will sponsor a conference on computers and art education. "We'll invite computer people who think their work is related to art, as well as art education professors and experienced art teachers. Then we'll hold a big brainstorming session and try to see where we can go with these things. The greatest trap in art education software or in any educational software," continues Korzenick, "is to try to remake an old curriculum in this new medium. If we look at video games, for example, we can see wonderfully complex things going on between kids and computers. What we have to do now is ask what we can do with computers that we can't do in art education with other media."

Despite Korzenick's efforts and those of others I've talked to, art classes may be the last places where we'll see computer creativity. The problem, according to Korzenick, may have more to do with attitudes toward art than toward computers. "In school," she says, "art always has to be in service of something that looks like 'work.' There's a systematic avoidance of pleasure, of fun, of fantasy. Those are the things that make art wonderful, and there doesn't seem to be any place for them in schools."

In school or out, I'm convinced that there's a lot more computer creativity going on than I've been able to unearth so far. If you're doing something or know of something in this field, please drop me a line at *Popular Computing*, POB 397, Hancock, NH 03449. I won't promise to acknowledge every letter, but if I get enough of them, I may run a follow-up column in a few months, highlighting more of what's happening with computers to foster creativity. □